

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of :
Pereira et al. :
: Application No.: 10/625,289 : Group Art Unit: 1751
: Filed: July 23, 2003 : Examiner: J. R. Hardee
: For: IMMIDAZOLINE QUATS :
:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF ABEL G. PEREIRA

I, Abel G. Pereira, declare as follows:

1. I am one of the inventors of the above-identified patent application, which has been assigned to Croda, Inc. of Edison, New Jersey. I have been employed by Croda, Inc. since 1978 and I am presently the Research Director. I received a B.S. in chemistry from Kean College in Union, New Jersey in 1994. I am experienced with the chemistry of imidazoline quats in general, and in particular with the methods of making imidazoline quats and quat mixtures, preparation of personal care and cosmetic products including same, as well as the emulsifying properties of such compounds.

2. I am familiar with the prosecution of the above-captioned U.S. Patent Application and its parent application, U.S. Patent Application No. 10/339,551. I have reviewed the Official Action mailed November 12, 2004, and references cited therein, including JP 60-81376, JP 58-144174, and U.S. Patent No. 5,721,205 (Barnabas et al.).

3. It is my understanding that the three references cited by the Examiner are all directed to a fabric softener, except for the Japanese Reference JP 58-144174 which also includes an example of a hair rinse formulation. (See Example 3 of JP 58-144174)

4. I have been advised that comparisons between my invention and the cited prior art must be made to the closest prior art. Because the present invention is related to a personal care and cosmetic composition, it was my opinion that Example 3 of the Japanese Reference JP 58-144174 exemplified the closest prior art.

5. Therefore, I attempted to replicate the hair rinse formulation disclosed in Example 3 of the Japanese Reference JP 58-144174 ("The Prior Art Formulation") as well as the nearly identical formulation recited in claim 1 of the present application ("The Claimed Formulation").

6. I have compared the properties of these two hair rinse formulations by measuring the viscosity and the reduction in combing force.

7. The Prior Art Formulation was prepared including the same ingredients and amounts listed in Example 3 of the Japanese Reference JP 58-144174 (see Table 1 below) using the following procedure:

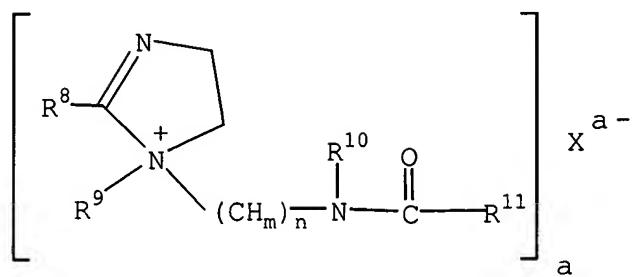
- (a) First, water was heated to 70-75°C.
- (b) Then, all of the listed ingredients in the amount specified in Example 3, which are dihydrogenated beef tallow alkyl dimethyl ammonium chloride, branched dialkyl methyl amine, branched dialkyl methylammonium chloride, cetyl alcohol, hydrogenated lanolin, glycerol monostearate, propylene glycol and water, were charged.

- (c) Then, the mixture was reheated to 70-75°C and was held at that temperature for 5 minutes while being stirred.
- (d) Finally, the mixture was allowed to cool to room temperature while being stirred.

8. The Claimed Formulation was prepared by including the same ingredients and amounts listed in Example 3 of the Japanese Reference JP 58-144174, EXCEPT that dihydrogenated beef tallow alkyl dimethyl ammonium chloride recited in that example was replaced with the claimed dihydrogenated beef tallow IMIDAZOLINIUM chloride (see Table 1 below), using the following procedure:

- (a) First, water was heated to 70-75°C.
- (b) Then, dihydrogenated beef tallow IMIDAZOLINIUM chloride, branched dialkyl methylammonium chloride, cetyl alcohol, hydrogenated lanolin, glycerol monostearate, propylene glycol and water were charged.
- (c) Then, the mixture was reheated to 70-75°C and was held at that temperature for 5 minutes while being stirred.
- (d) Finally, the mixture was allowed to cool to room temperature while being stirred.

9. The dihydrogenated beef tallow imidazolinium chloride meets to the limitations of claim 1 of the present application, since it conforms to the following formula (II):



(III)

wherein X is Cl⁻; a is 1; m is 2; n is 2; R⁹ is C₁ alkyl group; R¹⁰ is hydrogen; and R⁸ and R¹¹ are each derived from a fat mixture containing about 60% of C₁₈ alkyl groups. Hydrogenated beef tallow typically contains about 4.4% C₁₄, 31.9% C₁₆, 2.1% C₁₇, and 60.8% C₁₈ fatty acid substituents.

10. Table 1 below lists the specific ingredients and the amounts of those ingredients used to prepare The Prior Art Formulation and The Claimed Formulation, respectively:

TABLE 1

| | Ingredient | Prior Art Formulation | Claimed Formulation |
|---|---|-----------------------|---------------------|
| 1 | Dihydrogenated beef tallow alkyl dimethyl ammonium chloride | 2% | NONE |
| 2 | Dihydrogenated beef tallow IMIDAZOLINIUM chloride | NONE | 2% |
| 3 | Branched dialkyl methyl amine | 0.001% | 0.001% |
| 4 | Branched dialkyl methylammonium chloride | 0.001% | 0.001% |
| 5 | Cetyl alcohol | 1.5% | 1.5% |
| 6 | Hydrogenated Lanolin | 0.5% | 0.5% |
| 7 | Glycerol Monostearate | 4% | 4% |

| | Ingredient | Prior Art Formulation | Claimed Formulation |
|----|------------------|-----------------------|---------------------|
| 8 | Propylene Glycol | 3% | 3% |
| 9 | Water | 88.998% | 88.998% |
| 10 | TOTAL | 100% | 100% |

11. The viscosity measurements of these two formulations were taken at 25°C, twenty-four hours after the preparation of the formulations.

12. The results of the viscosity tests were tabulated as follows in Table 2 below:

TABLE 2

| | Prior Art Formulation | Claimed Formulation |
|-------------------------------|-----------------------|---------------------|
| Viscosity after 24 hrs @ 25°C | 275 centipoise | 68,500 centipoise |

13. The Prior Art Formulation had viscosity of 275 centipoise. This is not surprising since the primary teaching of this Japanese reference is use in fabric softeners; products which are usually of very low viscosity (i.e., liquid). At 275 centipoise, the resulting Prior Art Formulation is a free flowing liquid that will run through the fingers of a cupped hand. Based on my experience in personal care and cosmetic products, it is my opinion that such viscosity is commercially undesirable as a hair care product.

14. On the other hand, the Claimed Formulation had viscosity of 68,500 centipoise. At 68,500 centipoise, the resulting Claimed Formulation has a cream-like consistency, and is a superior viscosity builder and emulsifying conditioner for hair.

15. Thus, the use of imidazolinium quats in accordance with the present invention resulted in an emulsion formulation appropriate for the hair rinse application.

16. The effectiveness as a hair rinse formulation was also evaluated by testing the relative reduction in combing force of these two formulations.

17. The reduction in combing force was measured as follows: (1) the combing forces of hair tresses without any treatment of hair care formulations were measured using a Dia-stron Miniature Tensile Tester; (2) the hair tresses were treated with The Prior Art Formulation and The Claimed Formulation, respectively; and (3) the reduction in combing forces of the hair tresses after the treatment with The Prior Art Formulation and The Claimed Formulation, respectively, were determined using the Dia-stron Miniature Tensile Tester.

18. After the treatment with The Prior Art Formulation, the reduction in combing force was 18.64%.

19. After the treatment with the Claimed Formulation, the reduction in combing was 45.26%.

20. The results of the reduction in combing force tests were also tabulated as follows in Table 3 below:

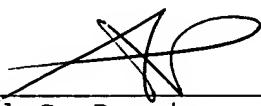
TABLE 3

| | Prior Art Formulation | Claimed Formulation |
|--|-----------------------|---------------------|
| Reduced combing force using a Dia-stron Miniature Tensile Tester | 18.64% | 45.26% |

21. Thus, the use of an imidazolinium quat in accordance with the present invention resulted in greater than a 100% improvement in combing force reduction.

I declare under penalty of perjury that the foregoing is true and correct. I further state that I have been warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and such willful false statements may jeopardize the validity of the application or any patent resulting therefrom. I state that all statements made of my own knowledge are true and all statements made on information and belief are believed to be true

Dated: March 2, 2005



Abel G. Pereira